

OUTDOOR LIGHTING DESIGN STANDARDS

Definitions

The following words and terms related to outdoor lighting are defined as follows:

1. **Disability Glare** The eye's Line-of-Sight contact with a direct light source, which causes a partial blindness
2. **Foot-candle** A unit of measure for luminance. A unit of luminance on a surface that is everywhere one foot from a uniform point source of light of one candle and equal to one lumen per square foot
3. **Full cut off type fixture** A luminaire or light fixture that; by design of the housing, does not allow any light dispersion or direct glare to shine above 90 degree, horizontal plane from the base of the fixture.
4. **Horizontal Luminance** The measurement of brightness from a light source, usually measured in foot-candles or lumens, which is taken through a light meter's sensor at a horizontal position.
5. **Light Trespass** Light from an artificial light source that is intruding into an area where it is not wanted or does not belong.
6. **Uplighting** Any light source that distributes illumination above a 90-degree horizontal plane.
7. **Uniformity Ratio (U. Ratio)** Describes the average level of illumination in relation to the lowest level of illumination for a given area. Example: U. Ratio =4:1 for the given area, the lowest level of illumination (1) should be no less than 25% or "4 time less" than the average (4) level of illumination.

Purpose

It is the goal of this section to provide further guidance to developers in implementing minimum requirements for lighting for all non-residential projects (non-residential projects include multi-family proposals). Recognizing that inappropriate and poorly designed or installed outdoor lighting causes unsafe and unpleasant conditions, limits residents ability to enjoy the nighttime sky, and results in unnecessary use of electric power. Conversely, it is also recognized that some outdoor lighting is appropriate in areas such as civic, commercial and industrial centers. To ensure appropriate lighting while minimizing its undesirable side effects, the following regulations are established.

General Requirements

1. That all exterior lights and illuminated signs shall be designed, located, installed and directed in such a manner as to prevent objectionable light trespass, and glare across, the property lines and or disability glare at any location on or off the property. The "maintained horizontal luminance recommendation" set by the illuminating Engineers Society of North America (IES) shall be observed. (See "LIGHTING TABLE")
2. All parking area lighting will be full cut-off type fixtures.
3. Full cut-off fixtures must be installed in a horizontal position as designed, or the purpose of the design is defeated, and disability glare will result.
4. Uplighting is prohibited. Externally lit signs, display, building and aesthetic lighting must be shielded to prevent direct glare and/or light trespass in excess of 0.2 foot-candles. The lighting must also be, as much as physically possible, contained to the target area. Internally lit signs are acceptable provided that they meet the requirements of the Raymond Zoning Ordinance.
5. All building lighting for security or aesthetics will be full cut-off or a shielded type, not allowing any upward distribution of light. Flood lighting is discouraged, and if used,

must be shielded to prevent:

- a. Disability glare for drivers or pedestrians,
 - b. Light trespass beyond the property line, and
 - c. Light above a 90 degree, horizontal plane. Unshielded wallpack type fixtures are not acceptable.
6. Adjacent to residential property, no direct light source will be visible at the property line at ground level or above.
 7. All non-essential lighting will be required to be turned off after business hours, leaving only the necessary lighting for security. ("Non-essential" can apply to: display, aesthetic, parking and sign lighting).
 8. When outdoor lighting installation or replacement is part of a development proposal for which site plan approval is required under these regulations, the Planning Board shall review and approve the lighting installation as part of its site plan approval.
 9. The applicant shall submit to the Town sufficient information, in the form of an overall exterior lighting plan, to enable the Town to determine that the applicable provisions will be satisfied. The lighting plan shall include at least the following:
 - a. A site plan, drawn to the required scale, showing all buildings, landscaping, parking areas, all proposed exterior lighting fixtures;
 - b. Specification (details) for all proposed lighting fixtures including photometric data, designation as IESNA "cut-off" fixtures, Color Rendering Index (CRI) of all lamps (bulbs), and other descriptive information on the fixtures;
 - c. Proposed mounting height of all exterior lighting fixtures;
 - d. Analyses and luminance level diagrams showing that the proposed installation conforms to the lighting level standards in this section. Off-site lighting should be considered in the analyses; and

- e. Drawing of all relevant building elevations showing the fixtures, the portions of the walls to be illuminated, the luminance levels of the walls, and the aiming points for any remote light fixtures.
10. Lighting of Gas Station/Convenience Store Aprons and Canopies: All of the above standards shall apply, as well as the standards:
- a. Lighting levels on gas station/convenience store aprons and under canopies shall be adequate to facilitate the activities taking place in such locations. Lighting of such areas shall not be used to attract attention to the businesses. Signs allowed under the appropriate section of the Raymond Zoning Ordinance shall be used for that purpose.
 - b. Areas on the apron away from the gasoline pump islands used for parking or vehicle storage shall be illuminated in accordance with the requirements for parking areas set forth elsewhere in this section. If no gasoline pumps are provided, the entire apron shall be treated as a parking area;
 - c. Areas around the pump islands and under canopies shall be illuminated in accordance with the LIGHTING TABLE;
 - d. Light fixtures mounted on canopies shall be recessed so that the lens cover is recessed or flush with the bottom surface (ceiling) of the canopy and /or shielded by the fixture or the edge of the canopy so that light is restrained to no more than 85 degrees from vertical.
11. When an outdoor lighting installation is being modified, extended, expanded or added to, the entire outdoor lighting installation shall be subject to the requirements of this section
12. Expansion, additions, or replacements to outdoor lighting installations shall be designed to avoid harsh contrast in color and or lighting levels
13. Where practicable, electrical service to outdoor lighting fixtures shall be underground.
14. Proposed lighting installations that are not covered in this section may be approved if

the Planning Board finds that they are designed to minimize glare, do not direct light beyond the boundaries in excess of 0.2 foot-candles of the area being illuminated or onto adjacent properties or streets, and do not result in excessive lighting levels.

15. For the purposes of these regulations, the mounting height of a lighting fixture shall be defined as the vertical distance from the grade elevation of the surface being illuminated to the bottom of the lighting fixture (i.e luminaire).
16. Temporary (3 months) Holiday lighting during the months of November, December and January shall be exempt from the provisions of this section, provided that such lighting does not create dangerous glare on adjacent streets or properties.
17. The Planning Board may modify or waive the requirements of this section if it determines that in so doing, it will not jeopardize the intent of these regulations.

LIGHTING TABLE

IES	Parking lot	IES Maintained Horizontal Luminance					
Levels of activity (Examples)		Recommendations (Footcandles)					
		General Parking & Pedestrian			Vehicles Only		
		Ave.	Min.	U Ratio	Ave.	Min.	U. Ratio
High		3.6	.9	4:1	2.0	.67	3:1
	Civic Recreational Facilities						
	Regional Shopping Centers						
	Fast Food Facilities						
	Gas/Convenience Store						
Medium		2.4	.6	4:1	1.0	.33	3:1
	Community Shopping Ctr.						
	Office Parks						
	Hospital Parking						
	Transportation Parking (Commuter Lots, Etc.)						
	Residential Complex Parking						
Low		.8	.2	4:1	.5	.13	4:1
	Neighborhood Shopping						
	Industrial Employee Parking						

Educational Facility Parking

Church Parking

IES States: "This recommendation is based on the requirement to maintain security at any time where there is low level of nighttime activity."

Areas used for storage parking only, may eliminate or reduce lighting with approval of the Planning Board.